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Application No. 10/820,367
Response to Office Action

Customer No: 01933

Listing of Claims:

Claims 1-9 (Canceled).

10. (New) A confocal chromatic wafer-inspection system comprising:

a table for supporting a wafer for inspection, the table being movable along an x-axis and along a y-axis in an XY plane;

5 movement means for moving the table in the XY plane;

a confocal chromatic height measurement system, perpendicular to the table, for measuring a range to a point on a surface of the wafer so as to enable recognition of changes in surface height of the wafer while the wafer moves with the table;

10 and

a computer operable for:

(i) storing a bumps map of the wafer;

(ii) controlling the movement means to move the table such that a measuring point of the confocal chromatic height measurement system crosses each bump of the wafer;

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(iii) storing a height profile of each bump;

(iv) at least one of: comparing the height profile of each bump to height profiles of other bumps on the wafer, and checking the height profile of each bump according to

20 predetermined criteria; and

(v) outputting comparison results.

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11. (New) The confocal chromatic wafer-inspection system of claim 10, further comprising:

a microscope integrated with the confocal chromatic height measurement system, for observing the surface of the wafer; and

a first camera for photographing the observed surface of the wafer.

12. (New) The confocal chromatic wafer-inspection system of claim 11, further comprising vertical movement means for elevating and lowering the microscope and the confocal chromatic height measurement system.

13. (New) The confocal chromatic wafer-inspection system of claim 10, further comprising a second camera for scanning the wafer;

5 wherein the computer recognizes bumps on the wafer based on at least one image captured by the second camera, and the computer creates the bumps map based on locations of the recognized bumps.

14. (New) The confocal chromatic wafer-inspection system of claim 13, wherein the second camera comprises a digital camera.

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15. (New) The confocal chromatic wafer-inspection system of claim 13, wherein the second camera comprises one of a line-scan camera and an array camera.

16. (New) The confocal chromatic wafer-inspection system of claim 13, wherein the second camera is elevated and lowered by the vertical movement means.

17. (New) The confocal chromatic wafer-inspection system of claim 10, wherein the system is adapted to measure: probe marks depth and profile, ink dot height and profile, height and profile of conductors of the surface of the wafer, and wafer thickness at different stages of production of the wafer.

18. (New) A method for confocal chromatic wafer-inspection comprising:

obtaining a digital image of a wafer by one of (i) photographing all of the wafer, and (ii) scanning one of sectors of the wafer and lines of the wafer to compose the digital image of the wafer;

mapping locations of bumps on the wafer by recognizing the bumps in the digital image of the wafer, based on predetermined criteria;

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- 10 planning a bumps-track that crosses each of the bumps on the wafer at least once;
- using a confocal chromatic height measurement system, positioned perpendicularly with respect to the wafer, to measure changes in height along the bumps-track;
- 15 obtaining a height profile of each of the bumps based on the measured changes in height; and
- analyzing the height profile of each of the bumps by at least one of: comparing the height profile of each bump to height profiles of other bumps on the wafer, and checking the height
- 20 profile of each bump according to predetermined criteria.